PATENT

Attorney Docket No.: A-70204-1/RMS/RMK/JML

UNITED STATES PATENT AND TRADEMARK OFFICE

*In re* Application of

Vi-En CHOONG, et al.

Examiner: Not Yet Known

Serial No.: 09/840,000

Filing Date: 19 April 2001

Group Art Unit: 1655

For: ***Method and Apparatus for Obtaining Electric Field-Enhanced Bioconjugation***

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence, including listed enclosures, is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Box Missing Parts, Assistant Commissioner for Patents, Washington, DC 20231 on 12 November 2001.

Signed: _____
Todd V. LEONE

Assistant Commissioner for Patents
Washington D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend the claims as follows:

Please cancel claims 1-14, 20 and 25without prejudice or disclaimer.

Please amend claims 15, 17, 19, 22, and 24 as follows:

a1

15. (Amended) A method for enhancing nucleic acid hybridization in a device having one or a plurality of microlocation(s), each microlocation comprising a nucleic acid probe present on a substrate, said method comprising the steps of:

(a) applying sample comprising one or more nucleic acids to said microlocation(s); and

(b) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids are transported to said nucleic acid probes present at said microlocation(s) under conditions sufficient for hybridization to occur.

a2

17. (Amended) The method of ~~claim~~ 15, which comprises the further step (c) of applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids that are not hybridized with said nucleic acid probes are transported away from said nucleic acid probes at said microlocation(s).

a3

19. (Amended) The method of ~~claim~~ 15, said device comprises a plurality of smicrolocations, wherein said microlocations each comprise a nucleic acid probe having known binding characteristics, and wherein the nucleic acid probe present at one microlocation differs from the nucleic acid probe present at other microlocations in a known and predetermined manner.

a4

22. (Amended) A method for enhancing nucleic acid hybridization in a device having one or a plurality of microlocation(s) present on a substrate, each microlocation comprising a nucleic acid probe, said method comprising the steps of:

(a) applying sample comprising one or more nucleic acids to said microlocation(s);

(b) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids are

Cont a4

transported to said nucleic acid probes at said microlocation(s) under conditions sufficient for hybridization to occur; and

(c) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids that are not hybridized with said nucleic acid probes are transported away from said nucleic acid probes at said microlocation(s).

a5

24. (Amended) The method of claim 22, said device comprising a plurality of microlocations, wherein said microlocations each comprise a nucleic acid probe having known binding characteristics, and wherein the nucleic acid probe present at one microlocation differs from the nucleic acid probe present at other microlocations in a known and predetermined manner.

## REMARKS

Claims 15-19, 21-24 and 26-27 are pending. Claims 1-14, 20 and 25 have been canceled. Claims 15, 17, 19, 22 and 24 have been amended such that they are directed towards a method for enhancing nucleic acid hybridization.

Attached hereto as Appendix A is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with Markings to Show Changes Made." For the Examiner's convenience a clean copy of the currently pending claims is attached hereto as Appendix B.

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The Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-1300 (Our Order No. A-70204-1/RMS/RMK/JML).

Respectfully submitted,

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Date: 11/13, 2001

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## APPENDIX A

## Version with Markings to Show Changes Made

In the claims:

Claims 1-14, 20 and 25 have been canceled.

15. (Amended) A method for enhancing nucleic acid hybridization [for bioconjugating binding entities] in a device having one or a plurality of microlocation(s), each microlocation comprising a nucleic acid probe present on a substrate, [wherein said microlocations comprise a first binding entity], said method comprising the steps of:

(a) applying sample comprising one or more [further binding entities] nucleic acids to said microlocation(s); and

(b) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more [further binding entities] nucleic acids are transported to said nucleic acid probes [first binding entities] present [in] at said microlocation(s) under conditions sufficient for hybridization [bioconjugation] to occur.

17. (Amended) The method of claim 15, which comprises the further step (c) of applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more [further binding entities] nucleic acids that are not hybridized [bioconjugated] with said nucleic acid probes [first binding entities] are transported away from said nucleic acid probes [first binding entities in] at said microlocation(s).

19. (Amended) The method of claim 15, said device [comprising] comprises a plurality of microlocations, wherein said microlocations each comprise a [first binding entity] nucleic acid probe having known binding characteristics, and wherein the [first binding entity] nucleic acid

probe present [in] at one microlocation differs from the [first binding entity] nucleic acid probe present [in] at other microlocations in a known and predetermined manner.

22. (Amended) A method for enhancing nucleic acid hybridization [bioconjugating binding entities] in a device having one or a plurality of microlocation(s) present on a substrate, each microlocation comprising a nucleic acid probe [wherein said microlocation(s) comprise a first binding entity], said method comprising the steps of:

(a) applying sample comprising one or more [further binding entities] nucleic acids to said microlocation(s);

(b) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more [further binding entities] nucleic acids are transported to said nucleic acid probes [first binding entities] [in] at said microlocation(s) under conditions sufficient for hybridization [bioconjugation] to occur; and

(c) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more [further binding entities] that are not hybridized [bioconjugated] with said nucleic acid probes [first binding entities] are transported away from said nucleic acid probes [first binding entities in] at said microlocation(s).

24. (Amended) The method of claim 22, said device comprising a plurality of microlocations, wherein said microlocations each comprise a [first binding entity] nucleic acid probe having known binding characteristics, and wherein the nucleic acid probe [first binding entity] present [in] at one microlocation differs from the nucleic acid probe [first binding entity] present [in] at other microlocations in a known and predetermined manner.

## APPENDIX B

## PENDING CLAIMS

15. (Amended) A method for enhancing nucleic acid hybridization in a device having one or a plurality of microlocation(s), each microlocation comprising a nucleic acid probe present on a substrate, said method comprising the steps of:

(a) applying sample comprising one or more nucleic acids to said microlocation(s); and

(b) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids are transported to said nucleic acid probes present at said microlocation(s) under conditions sufficient for hybridization to occur.

16. (Unchanged) The method of claim 15, wherein said microlocation(s) comprise a porous media.

17. (Amended) The method of claim 15, which comprises the further step (c) of applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids that are not hybridized with said nucleic acid probes are transported away from said nucleic acid probes at said microlocation(s).

18. (Unchanged) The method of claim 17, wherein steps (b) and (c) are repeated at least once.

19. (Amended) The method of claim 15, said device comprises a plurality of microlocations, wherein said microlocations each comprise a nucleic acid probe having known binding characteristics, and wherein the nucleic acid probe present at one microlocation differs from the nucleic acid probe present at other microlocations in a known and predetermined manner.

21. (Unchanged) The method of claim 15, wherein charge is applied to said device in such a way as to produce a stirring or mixing motion, or cause a rotational motion at said microlocation(s).

22. (Amended) A method for enhancing nucleic acid hybridization in a device having one or a plurality of microlocation(s) present on a substrate, each microlocation comprising a nucleic acid probe, said method comprising the steps of:

(a) applying sample comprising one or more nucleic acids to said microlocation(s);

(b) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids are transported to said nucleic acid probes at said microlocation(s) under conditions sufficient for hybridization to occur; and

(c) applying charge to said device to produce an electric field at said microlocation(s) without creating current flow in said microlocation(s), and such that said one or more nucleic acids that are not hybridized with said nucleic acid probes are transported away from said nucleic acid probes at said microlocation(s).

23. (Unchanged) The method of claim 22, wherein steps (b) and (c) are repeated at least once.

24. (Amended) The method of claim 22, said device comprising a plurality of microlocations, wherein said microlocations each comprise a nucleic acid probe having known binding characteristics, and wherein the nucleic acid probe present at one microlocation differs from the nucleic acid probe present at other microlocations in a known and predetermined manner.

26. (Unchanged) The method of claim 22, wherein said microlocation(s) comprise a porous media.

27. (Unchanged) The method of claim 22, wherein charge is applied to said device in such a way as to produce a stirring or mixing motion, or cause a rotational motion at said microlocation(s).